



# Inside Energy

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## RE: Electric Vehicles an Expensive Way to Reduce Carbon Dioxide Emissions

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Numerous programs have been suggested to reduce emissions of carbon dioxide to ease global warming concerns. Few are as expensive as switching to battery powered motor vehicles. A comparison between the Chevrolet Bolt battery electric compact hatchback, and its near twin Chevrolet Cruze hatchback powered by a conventional internal combustion engine showed the cost to reduce a ton of emissions would be a whopping \$1550. For perspective, the most recent regional carbon dioxide emission allowance auction price was \$4.50 a ton, a recent EPA regulation counted the value of emissions reductions from power plants at between \$1 and \$7 a ton, and the most recently proposed national tax rate on emissions would average \$22 a ton over the expected eight year life of the Bolt.

The high cost is driven by the cost of batteries. The Bolt uses the same lithium ion technology as your cell phone except its 60 KWh battery weighs in at about 1,200 pounds, for a range of 238 miles per charge. The initial cost of a Bolt is about twice as much as a Cruze, or about \$19,000, using the Manufacturers Suggested Retail price plus the cost of a charger for your garage, and the higher sales tax. Slow charging times lead to most electric vehicle owners charging overnight at home. For that higher price 12.5 tons of carbon dioxide emissions will be saved, hence the \$1550 cost per ton<sup>1</sup>.

Electric vehicle proponents often cite lower fuel and maintenance costs need to be considered, and those items do account for about \$6,500 in savings over an eight year, 100,000 mile vehicle life. However, throw in higher finance costs for the more expensive vehicle, and the limited resale value of a used electric vehicle facing an announced \$16,000 battery replacement bill, and the savings are more than wiped out.

So, why does anyone buy such a vehicle? There is a \$7,500 federal Investment Tax Credit, and eight states have additional subsidies ranging from \$1,500 to \$5,000. Apparently, federal and state grants are needed to convince people to buy. A comparison of electric vehicle fleet size by state to how much money each state spent on subsidies yielded a very high correlation of 0.88. When Georgia ended a \$5,000 state subsidy, sales fell 89%.

Sales are also limited to high income families who can take the full federal tax credit. A survey conducted by "TrueCar" found a typical Ford Focus electric car buyer earned \$199,000 a year, while a typical standard Focus buyer earned \$77,000 a year. These subsidies are definitely a transfer of wealth from lower income people to higher income people.

There is a debate going on right now in Congress as to whether to extend the federal tax credit, and on whether to lift a cap on allowing the credit for only the first 200,000 electric vehicles produced by a car maker. We hope this subsidy for the wealthy is allowed to expire.

*Note 1; Bolt gets 3.6 miles/KWh uses 27,778 Kwh in 100,000 miles, emits 0.933 pounds/KWh (PJM Systems Mix), or 13 tons, Cruze gets 37 miles/gallon, uses 2703 gallons, emits 18.9 pounds/gallon of E10 gasoline, or 25.5 tons.*